

WHAT IS CLAIMED AS NEW AND DESIRED TO BE SECURED BY LETTERS  
PATENT OF THE UNITED STATES IS:

1. A toner composition comprising:  
toner particles comprising:

5           a binder resin; and  
          a colorant,

          and a charge controlling agent which is at least located  
on a surface of the toner particles,

          wherein the toner composition has a spherical degree of  
10   from 0.96 to 0.99, and wherein the toner composition satisfies  
the following relationship:

$$10 \leq M/T \leq 1,000$$

wherein M represents a quantity of an element on a surface of  
the toner particles in units of % by weight, wherein the element  
15   is included only in the charge controlling agent, and is one  
of elements of second to fifth periodical elements in the long  
form periodic table other than carbon, oxygen and rare gas  
elements; and T represents a quantity of the element in the toner  
composition in units of % by weight.

20           2. The toner composition according to Claim 1, wherein  
the ratio M/T is from 100 to 800.

          3. The toner composition according to Claim 1, further  
25   satisfying the following relationship:

$$0.7 \leq (Q/M1)/(Q/M2) \leq 1.3$$

wherein Q/M1 represents a charge quantity of the toner

composition in units of  $\mu\text{C/g}$  when the toner composition is mixed with a carrier coated with a silicone resin for 15 seconds and Q/M2 represents a charge quantity of the toner composition in units of  $\mu\text{C/g}$  when the toner composition is mixed with the carrier for 600 seconds.

4. The toner composition according to Claim 1, further having a volume average particle diameter ( $D_v$ ) of from  $2\ \mu\text{m}$  to  $8\ \mu\text{m}$  and a number average particle diameter ( $D_n$ ), wherein a ratio  $D_v/D_n$  is not greater than 1.2.

5. The toner composition according to Claim 1, wherein the charge controlling agent is included in the toner composition in an amount of from 0.01 % to 2.0 % by weight based on total weight of the toner particles.

6. The toner composition according to Claim 1, wherein the charge controlling agent comprises a compound selected from the group consisting of metal complexes of salicylic acid and salicylic acid derivatives and metal salts of salicylic acid and salicylic acid derivatives.

7. The toner composition according to Claim 1, wherein the toner particles further comprise a wax, wherein the wax is dispersed in the toner particles while having an average dispersion diameter of from  $0.2\ \mu\text{m}$  to  $2.0\ \mu\text{m}$ .

8. The toner composition according to Claim 1, wherein the binder resin comprises a polyester resin in a largest amount, and wherein the polyester resin has a molecular weight distribution such that a peak is observed in a range of from 1,000 to 30,000 and a fraction having a molecular weight not less than 30,000 is included in the polyester resin in an amount of from 1 % to 10 % by weight.

9. The toner composition according to Claim 1, wherein the toner particles are prepared by a method selected from the group consisting of:

a first method comprising:

kneading the binder resin and the colorant upon application of heat to prepare a mixture;

15 pulverizing the mixture to prepare a powdery mixture; classifying the powdery mixture to prepare raw toner particles; and

applying at least one of heat or a mechanical impulse force to the raw toner particles to prepare the toner particles, 20 wherein the toner particles have a spherical degree of from 0.96 to 0.99;

a second method comprising:

suspension-polymerizing one or more monomers, which optionally includes the colorant, in an aqueous liquid to 25 prepare the toner particles;

a third method comprising:

dissolving the binder resin in an organic solvent to

prepare a solution of the binder resin;

dispersing the solution and the colorant in an aqueous liquid to prepare a dispersion of the binder resin and the colorant; and

5 drying the dispersion of the binder resin and the colorant to prepare the toner particles;

a fourth method comprising:

dispersing the binder resin in an organic solvent to prepare an organic solvent dispersion of the binder resin;

10 dispersing the organic solvent dispersion and the colorant in an aqueous liquid to prepare an aqueous dispersion of the binder resin and the colorant; and

drying the aqueous dispersion to prepare the toner particles;

15 a fifth method comprising:

reacting a prepolymer with a compound in an organic solvent to prepare a solution of the binder resin;

dispersing the solution and the colorant in an aqueous liquid to prepare an aqueous dispersion of the binder resin and  
20 the colorant; and

drying the aqueous dispersion to prepare the toner particles;

a sixth method comprising:

25 reacting a prepolymer with a compound in an organic solvent to prepare an organic solvent dispersion of the binder resin;

dispersing the organic solvent dispersion and the

colorant in an aqueous liquid to prepare an aqueous dispersion of the binder resin and the colorant; and

drying the aqueous dispersion to prepare the toner particles; and

5 a seventh method comprising:

reacting a prepolymer with a compound in an aqueous liquid comprising the colorant to prepare an aqueous dispersion of the binder resin and the colorant; and

drying the aqueous dispersion to prepare the toner particles.  
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10. The toner composition according to Claim 1, wherein the binder resin comprises a polyester resin.

15 11. The toner composition according to Claim 10, wherein the polyester resin comprises a urea bonding.

12. A method for manufacturing a toner composition comprising toner particles and a charge controlling agent,  
20 comprising:

preparing toner particles comprising a binder resin and a colorant; and

mixing the toner particles with a charge controlling agent using a mixer having a rotor to form the toner composition,

25 wherein the toner composition has a spherical degree of from 0.96 to 0.99, and wherein the toner composition satisfies the following relationship:

$$10 \leq M/T \leq 1,000$$

wherein M represents a quantity of an element on a surface of the toner particles in units of % by weight, wherein the element is included only in the charge controlling agent, and is one  
5 of elements of second to fifth periodical elements in the long form periodic table, other than carbon, oxygen and rare gas elements; and T represents a quantity of the element in the toner composition in units of % by weight.

10 13. The method according to Claim 12, wherein the mixer comprises:

a vessel configured to contain the toner particles and the charge controlling agent;

a driving shaft arranged so as to substantially vertically  
15 pass through a bottom of the vessel and configured to rotate the rotor, wherein the rotor is provided on the driving shaft and rotates substantially parallel with the bottom of the vessel; and

a cylindrical member located at a position in an extension  
20 direction of the driving shaft.

14. The method according to Claim 13, wherein the vessel has a spherical form and the bottom of the vessel has a flat circular form, and wherein the driving shaft passes through a  
25 substantially center of the flat circular bottom of the vessel.

15. The method according to Claim 13, wherein the mixer

satisfies the following relationship:

$$L \geq H/10$$

wherein H represents an inside height of the vessel and L represents an inside length of the cylindrical member in the vessel.

16. The method according to Claim 13, wherein the mixer satisfies the following relationship:

$$R2 \geq R1/10$$

wherein R1 represents an inside width of the vessel and R2 represents an inside diameter of the cylindrical member.

17. The method according to Claim 13, wherein the cylindrical member has a tip having a trumpet form.

18. The method according to Claim 12, wherein the mixing step comprises:

premixing the toner particles with the charge controlling agent while rotating the rotor at a rotation speed lower than 50 m/s; and

then mixing the toner particles with the charge controlling agent while rotating the rotor at a rotation speed not lower than 50 m/s.

19. The method according to Claim 12, wherein the toner composition further comprises an external additive, and wherein the mixing step comprises:

mixing the toner particles with the charge controlling agent and the external additive using a mixer having a rotor to prepare the toner composition.

5           20. The method according to Claim 12, wherein the toner particles preparing step comprises:

          kneading a binder resin and a colorant upon application of heat to prepare a mixture;

          pulverizing the mixture to prepare a powdery mixture;  
10           classifying the powdery mixture to prepare raw toner particles; and

          applying at least one of heat and mechanical impulse force to the raw toner particles to prepare the toner particles, wherein the toner particles have a spherical degree of from 0.96  
15   to 0.99.

          21. The method according to Claim 12, wherein the toner particles preparing step comprises:

          suspension-polymerizing one or more monomers, which  
20   optionally includes the colorant, in an aqueous liquid to prepare the toner particles.

          22. The method according to Claim 12, wherein the toner particles preparing step comprises:

25           dissolving the binder resin in an organic solvent to prepare a solution of the binder resin;

          dispersing the solution and the colorant in an aqueous



liquid to prepare a dispersion of the binder resin and the colorant; and

drying the dispersion of the binder resin and the colorant to prepare the toner particles.

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23. The method according to Claim 12, wherein the toner particles preparing step comprises:

dispersing the binder resin in an organic solvent to prepare an organic solvent dispersion of the binder resin in the organic solvent;

dispersing the organic solvent dispersion and the colorant in an aqueous liquid to prepare an aqueous dispersion of the binder resin and the colorant; and

drying the aqueous dispersion to prepare the toner particles.

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24. The method according to Claim 12, wherein the toner particles preparing step comprises:

reacting a prepolymer with a compound in an organic solvent to prepare a solution of the binder resin;

dispersing the solution and the colorant in an aqueous liquid to prepare a aqueous dispersion of the binder resin and the colorant; and

drying the aqueous dispersion to prepare the toner particles.

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25. The method according to Claim 12, wherein the toner

particles preparing step comprises:

reacting a prepolymer with a compound in an organic solvent to prepare an organic solvent dispersion of the binder resin;

5       dispersing the organic solvent dispersion and the colorant in an aqueous liquid to prepare an aqueous dispersion of the binder resin and the colorant; and

drying the aqueous dispersion to prepare the toner particles.

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26. The method according to Claim 12, wherein the toner particles preparing step comprises:

reacting a prepolymer with a compound in an aqueous liquid comprising the colorant to prepare an aqueous dispersion of the  
15 binder resin and the colorant; and

drying the aqueous dispersion to prepare the toner particles.

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27. The method according to Claim 12, wherein the binder resin comprises a polyester resin having a urea bonding.

28. The method according to Claim 12, wherein in the mixing step the rotor is rotated at a rotation speed of from 40 m/s to 150 m/s.

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